WILDLIFE MANAGEMENT AND RESEARCH NOTES

INDIANA DIVISION OF FISH&WILDLIFE

No.	Author	Date
883	Steven E. Backs, Wildlife Research Biologist Title: Breeding Indices of Ruffed Grouse - Spring, 2005.	4/28/05

Abstract: *Ruffed grouse breeding populations are at the lowest level recorded in 27 years. The 2005 drumming index for 8 survey control routes was 0.03 drumming males heard per stop, less than 4% of levels recorded during the peak years of 1979-81. The 5-year mean drumming index (2000-2005) is slightly less than 0.07 drummers per stop or approximately 1 drummer heard every 15 stops. Only 2 grouse were heard on the Maumee Grouse Study Area for an estimate density of 0.5 grouse/100 acres compared to 5.8 grouse/100 acres 25 years ago. Prospects for population recovery are poor given the continual advancement of forest succession and the lack of active forest management on public forestlands in south-central Indiana, the core and remnant range of the ruffed grouse in Indiana. Ruffed grouse population levels are projected to drop below "viable population levels" within the next decade, or sooner, in portions of their existing range in south-central Indiana unless some intervention (e.g. timber harvests of sufficient intensity) or sizable natural disturbances occur across the forested landscape to create early successional forest habitats.*

Federal Aid Pittman-Robertson Project/Research Job: W-26-R-36 Job 16-G-3; Work Plan # 200302

Ruffed grouse *(Bonasa umbellus spp.)* breeding population indices were estimated during the spring of 2005 along 10 roadside drumming trend routes conducted annually plus 4 additional routes on Crane Naval Weapon Support Center (Crane). The annual drumming activity center count was conducted at the Maumee Grouse Study Area located on Hoosier National Forest in Jackson/Brown counties. Roadside counts ranged from 0 to 0.13 grouse heard per stop (15 stops/route) **(Table 1)**. The upper range of these values has been relatively low since when a downward trend in the grouse population became evident in the mid-1980's. In 2005, 4 routes showed an increase, 7 routes showed a decrease, and 3 had no trend change from the previous year.

The combined mean for the 8 control areas was 0.03 grouse heard per stop (Drumming Index; DI), the lowest DI in the recorded 27 years **(Table 2)**, and the lowest DI since roadside drumming surveys were initiated in 1953 The 5-year mean drumming index (2001 to 2005) was slightly less than 0.07 drummers per stop or approximately one drummer heard every 15 stops. Drumming indices for the control routes indicate grouse breeding populations have declined fairly steadily the last two decades and are now less than 4% of levels recorded during the peak years of 1979-81.

Two drumming activity centers were located on the Maumee Grouse Study Area for estimated spring breeding population density of 0.5 grouse/100 acres **(Table 3).** In 2004, only 1 activity center was located. In 1980, 24 activity centers were identified and the estimated density was 5.8 grouse/100acres. Habitat on the Grouse Study Area is fairly reflective of habitat conditions on the Pleasant Run Unit of Hoosier National Forest. The 2 activity centers located in 2005 were associated with abandoned, overgrown field openings. Since active vegetation management is not allowed under the current management prescription for this area of Hoosier

National Forest, these small ephemeral pieces of grouse breeding habitat are expected to disappear soon (# 5 years).

Roadside drumming indices and Maumee density estimates show parallel downward trends over 2 decades **(Figure 1)**. A population model analysis for ruffed grouse in Indiana projects that ruffed grouse will not exist at viable population levels within the next decade on the Hoosier National Forest under current trends in forest succession and management. Based on similar trends in grouse populations, forest succession, and land management, a similar fate probably faces ruffed grouse on adjacent public forestlands in south-central Indiana.

Early forest successional stages of seedling/sapling/pole size hardwoods are the primary components of habitat for ruffed grouse, woodcock and a host of other wildlife species that were historically created by either natural disturbances (e.g. tornadoes, fire storms, insect outbreaks) across a large continuous forested landscape or within transitional zones between grasslands and forests. These types of habitats and associated wildlife are undergoing significant and parallel declines in the eastern United States (See a series of papers in "Conservation of woody, early successional habitats and wildlife in the eastern United States" pages 407-494, Wildlife Society Bulletin Vol. 29, No. 2, Summer 2001). Until public land managers again have the flexibility and the public support to use various vegetation or timber management tools to mimic or emulate natural disturbances on what remains of the contiguous forest ecosystem, we can expect further losses in early successional habitats and dependent wildlife species.

Table 1. Numbers of ruffed grouse heard on roadside drumming counts in Indiana between 29 March -19 April 2005.

County / Area	Total Routes	Total Stops	Cumm. Total Grouse Heard	Grouse Heard Highest Count	Cumm Total Drums	Highest Drum Count	Total No. Seen	Grouse Heard Per Stop 1/ 2004	Grouse Heard Per Stop 1/ 2005	Drummings Per Stop 1/ 2004	Drummings Per Stop 1/ 2005	Grouse Heard Per Stop Trend Directions 94	95	96	97	98	99	00	01	02	03	04	05
* Jackson, Brown, Monroe (Hickory Ridge, USFS)	4	60	1	1	2	2	0	0.00	0.07	0.00	0.13	+	-	0	+	+	-	+	-	0	-	0	+
*Owen-Putnam	2	30	1	1	3	3	0	0.00	0.07	0.00	0.20	-	-	+	-	-	0	+	-	-	0	0	+
*Perry Co. (Oriole-St. Croix-USFS)	2	30	0	0	0	0	0	0.07	0.00	0.13	0.00	-	0	0	0	-	+	0	+	0	-	+	-
*Washington State Forest	2	30	1	1	2	2	0	0.13	0.07	0.27	0.13	-	+	-	+	0	-	0	0	+	-	0	-
**Lawrence & Orange (Lost River E, USFS)	2	30	0	0	0	0	0	0.13	0.00	0.27	0.00	+	+	-	+	0	-	-	-	-	+	+	-
Martin & Orange (Lost River W, USFS)	2	30	2	2	4	4	0	0.00	0.13	0.00	0.27	-	-	+	-	+	0	0	0	0	-	-	+
**Morgan-Monroe State Forest	2	30	0	0	0	0	0	0.13	0.00	0.40	0.00	-	+	-	+	-	0	0	0	-	+	0	-
**Greene	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00	+	-	-	0	+	-	+	+	+	-	+	0
**Orange (Lick Creek, USFS)	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00	0	0	-	-	0	-	+	0	+	-	-	0
Jefferson	2	30	0	0	0	0	1	0.07	0.00	0.07	0.00	-	0	0	+	+	0	0	-	0	+	0	-
Crane Naval Base ***																							
NW-Cent. Yellow Rt	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00												0
NE Pink Rt.	2	30	3	2	3	2	0	0.00	0.13	0.00	0.13												+
SE-Cent. OrangeRt.	2	30	0	0	0	0	0	0.07	0.00	0.20	0.00												-
South Blue Rt.	2	30	0	0	0	0	0	0.13	0.00	0.33	0.00												-

1/ Indices calculated using route with highest count. Trend direction from previous year indicated; +, -, 0 = no change, NT = no trend.

* Areas surveyed annually and used as controls to index overall population trends.

** New (1987) areas added as controls to broaden grouse range coverage.

*** Special interest routes conducted on Crane Naval Base during 2004 & 2005 primarily to assess relative wild turkey densities. Drumming grouse were also counted.

Table 2. Drumming count indices along roadside control routes, 1979-2005.

	Male Grouse Heard Per Stop by Roadside Route *								
Year	HICKORY	OWPUT	PERRY	WASH	LR-EAST	MORGAN	GREENE	LICKCR	MEAN
1979	1.00	0.27	-	0.53	-	-	-	-	1.80
1980	1.27	0.53	0.60	0.73	-	-	-	-	0.78
1981	1.33	0.89	0.60	0.80	-	-	-	-	0.91
1982	0.73	0.40	0.20	1.07	-	-	-	-	0.60
1983	0.53	0.27	0.33	0.40	-	-	-	-	0.38
1984	0.93	0.20	0.33	0.00	-	-	-	-	0.37
1985	1.00	0.47	0.20	0.07	-	-	-	-	0.44
1986	1.00	0.33	0.13	0.07	-	-	-	-	0.38
1987	0.40	0.47	0.20	0.13	0.27	0.27	0.13	0.33	0.28
1988	0.33	0.13	0.07	0.07	0.33	0.33	0.27	0.47	0.25
1989	0.67	0.20	0.21	0.07	0.27	0.47	0.20	0.73	0.35
1990	0.47	0.20	0.13	0.13	0.37	0.47	0.27	0.47	0.31
1991	0.13	0.13	0.07	0.00	0.40	0.13	0.13	0.53	0.19
1992	0.13	0.13	0.13	0.00	0.27	0.07	0.27	0.40	0.18
1993	0.07	0.40	0.13	0.07	0.33	0.40	0.47	0.40	0.28
1994	0.20	0.07	0.07	0.00	0.40	0.27	0.53	0.40	0.24
1995	0.13	0.00	0.07	0.07	0.47	0.47	0.13	0.40	0.22
1996	0.13	0.27	0.07	0.00	0.33	0.27	0.07	0.20	0.17
1997	0.20	0.20	0.07	0.07	0.53	0.40	0.07	0.07	0.20
1998	0.27	0.07	0.00	0.07	0.53	0.07	0.27	0.07	0.17
1999	0.07	0.07	0.07	0.00	0.40	0.07	0.07	0.00	0.09
2000	0.13	0.20	0.00	0.00	0.27	0.07	0.20	0.13	0.13
2001	0.07	0.07	0.07	0.00	0.13	0.07	0.13	0.13	0.08
2002	0.07	0.00	0.07	0.27	0.00	0.00	0.20	0.20	0.10
2003	0.00	0.00	0.00	0.13	0.07	0.13	0.07	0.07	0.06
2004	0.00	0.00	0.07	0.13	0.13	0.13	0.00	0.00	0.06
2005	0.07	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.03

* = Indices calculated using route with highest count.

HICKORY = Hickory Ridge (USFS), Lawrence and Jackson Counties
OWPUT = General area of Owen-Putnam St. Forest
PERRY = northern portion of Perry Co.(USFS)
WASH = general area of Jackson-Washington St. Forest in Washington County
LR-EAST = Lost River Unit - East, USFS, Lawrence and Orange Counties.
MORGMON = general area of Morgan-Monore St. Forest in Morgan county.
GREENE = eastern Greene County
LICKCR = Lick Creek Area, USFS, in Orange County.
MEAN = Arithmetic average value for all routes

Table 3. Spring breeding densities of ruffed grouse, Maumee Grouse Study Area.

YEAR	DRUMMING ACTIVITY CENTERS *	POPULATION DENSITY Per 40 ha (100 a) **
1969	12	2.9
1970	20	4.8
1971	16	3.9
1972	19	4.6
1973	9	2.2
1974	survey not conducted	
1975	14	3.4
1976	14	3.4
1977	18	4.5
1978	20	5.0
1979	17	4.3
1980	24	5.8
1981	20	4.8
1982	19	4.6
1983	11	2.7
1984	11	2.7
1985	11	2.7
1986	14	3.4
1987	10	2.4
1988	8	1.9
1989	8	1.9
1990	16	3.9
1991	9	2.2
1992	9	2.2
1993	7	1.6
1994	4	0.9
1995	4	0.9
1996	12	2.4
1997	8	1.7
1998	7	1.6
1999	10	2.3
2000	6	1.4
2001	5	1.1
2002	6	1.4
2003	2	0.5
2004	1	0.2
2005	2	0.5

* Area covered varied from 800 to 1,000 acres; mean area covered = 875 acres.

** Assumes a 50:50 sex ratio and represents a minumum because of non-drumming males (Gulion 1981)

Figure 2. Indiana Grouse Population Trends